



SubProMais - Use of agro-industrial by-products in animal feed

COUNTRY

Portugal

PROJECT PROMOTER

National Scientific and Technological System (INIAV)

FUNDING

2014-2020 RDP funds

RDP MEASURE

M16 – Cooperation (EIP-AGRI)

DURATION

2018 – 2021

CONTRIBUTION TO

- generating environmental benefits
- mitigating climate change
- increasing efficiency of biomass resource use
- creating value through improved production methods or processing technology

KEYWORDS

Added value, livestock production, by-products, bio-waste, co-operation, pilot project, innovation

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The initiative

This EIP Operational Group will carry out a study of agro-industrial by-products from carrots, sweet potatoes, citrus, tomato, apple and beetroot, that can be used in animal feed, especially in the diets of production animals (laying hens, growing lambs and breeding ewes). These can be an alternative to conventional raw materials (cereals and oilseeds). The study intends to collect and synthesize existing information, add to this body of knowledge and identify the best way to integrate these by-products into the diets of animals.

subpromais



subprodutos da agroindústria
na alimentação animal

EXPECTED RESULTS

- ✓ Reduce the cost of animal feed and consequently improve the profitability of livestock farms;
- ✓ Replace costly imported raw materials (cereals) that should in priority be used for human consumption;
- ✓ Maintain or improve the quality of the final product;
- ✓ Recycle high-polluting waste;
- ✓ Create an additional source of income for agro-industries that produce these by-products, and reduce the costs associated with their elimination.



Context

The profitability of livestock farms in Portugal depends to a great extent on the cost of feeding animals, which is often the principal production cost.

The animal feed production industry consumes large quantities of imported raw materials, including cereals and oilseed cake. This high dependence on imports, fluctuating prices and a lack of standardisation concerning the composition of the raw materials, are constraints for the industry, which is keen to find a solution.

The Portuguese agro-industry generates several by-products that can be used to feed livestock as well as work and companion animals. In some cases, these by-products are already being used in animal feed. However, due to the lack of available information, this is not always done in a way that is efficient and systematic. More accurate information is needed concerning their chemical composition and nutritional value, and the correct methods for conservation and processing, etc.

Objective

This initiative aims to study agro-industrial by-products that can be used in animal feed as alternatives to conventional raw materials (cereals and oilseeds). Its objective is to collect and synthesize existing information; to add to this body of knowledge and to identify the best way to integrate these by-products into the diets of animals. The findings of the study will then be made available to the livestock sector and the general public.

Activities

SubProMais includes in its partnership the National Scientific and Technological System (INIAV), a company producing feed (Rações Zêsero); a sheep farm (Carlos & Helder Alves); a private company developing software for the agricultural sector (RURALBIT); a research and development private entity (CEBAL) and a private association specialising in knowledge transfer. In a multi-stakeholder approach, partners will participate in proposed actions with varying levels of involvement.

Phase 1) Creation of a database and entry of the by-products data for storage

Task 1.1 - Creating and maintaining a database and an online platform

Duration - 48 months, start date - 2/1/2018

A database of technical information about the by-products was created and made available online. The online

platform disseminates the information to potential users.

Task 1.2 – Agro-industry survey and collection of existing information for entry into the database

Duration - 10 months, start date - 2/1/2018

A survey was conducted via email, in order to collect information about the by-products (regarding the quantities, production times and geographical distribution of those that can be used in animal feed) produced by agro-industries in the regions of Alentejo and Ribatejo.

As some by-products have already been studied in universities, laboratories and research centres, the second task was to collect and synthesize existing information and add it to the database as well.

Task 1.3 - Sample collection and chemical and nutritional analysis of by-products

Duration - 26 months, start date- 1/3/2018

Samples of the by-products that would be used for chemical and nutritional characterization were collected.

Phase 2) Conservation and processing of by-products

Task 2.1 - By-products dehydration and chemical and nutritional characterization.

Duration - 16 months, start date - 1/5/2019

Within the scope of this study, it is not possible to assess the dehydration of a large number of by-products, both due to the costs involved, but also due to time limitations. Therefore, the selection of by-products to be tested was made according to the interest expressed by compound feed manufacturers and thus focused on the by-products of carrots, sweet potatoes, citrus fruits, tomato, apple and beetroot.

This task will define essential dehydration parameters such as: the type of fractionation for each food; the time needed for dehydration to take place; the ideal temperature in order to optimize the process while maintaining the food's physical and nutritional characteristics.

Task 2.2 - Conservation as silage in experimental silos

Duration - 16 months, start date - 1/5/2019

Based on the previous evaluation of specific characteristics, six by-products were selected for preservation in experimental silos with a capacity of about 3 kg, with or without additives, or with other foods that suppress their nutritional imbalances. The silages obtained will be analysed to establish their chemical characterization, fermentative quality and nutritional value.

Phase 3) Production tests

This project aims to study the use of by-products mainly in the diets of production animals. The experimental part will include laying hens, growing lambs and breeding ewes.

Task 3.1 - Testing on laying hens

Duration - 8 months, start date - 1/9/2020

The laying hens will be fed with different amounts of dehydrated tomato pulp. These diets will be compared to a conventional one for their effect on: poultry weight, daily intake, feed intake, feed conversion ratio, mortality, egg weight, egg colour and egg content in beta carotenes, natural antioxidants and fatty acids.

Task 3.2 - Tests on growing lambs

Duration - 8 months, start date - 1/9/2020

In order to test 3 diets incorporating dehydrated by-products on growing lambs, a production trial will be carried out, in which the diets will be compared with a control diet. The objective of this study is to evaluate the effect of diets on animal growth and the quality of the final products obtained (carcass and meat).

Task 3.3 - Production trials on breeding ewes

Duration - 18 months, start date - 3/6/2019

During this trial 60 sheep will remain on an annual legume and grass mix pasture (speedmix). The necessary procedures for the synchronization of estrus will be carried out for natural mating and, after 45 days, the animals will be checked for pregnancy by ultrasound. Two of the previously tested silages (Phase 2-Task 2.2) that show the greatest potential in terms of nutritional value and conservation conditions will be produced in large enough quantities to be fed to the animals during the period before parturition (1 month) and during lactation (2 months). During these periods, the project will monitor the food intake of the sheep, their physical condition and their weight, as well as a set of biochemical parameters related to the metabolic state of the sheep and the growth of the lambs.